

Amendments to the Claims

Claim 1 (Currently Amended): An isolated polynucleotide comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) a polynucleotide comprising at least 200 contiguous bases of the sequence set forth in SEQ ID NO: 35;~~

a) b) a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID No: 35;

b) e) a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID No: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) ~~(a) through (e)~~.

Claim 2 (Currently Amended): A recombinant expression cassette comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) a polynucleotide comprising at least 200 contiguous bases of the sequence set forth in SEQ ID NO: 35;~~

a) b) a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID No: 35;

b) e) a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID No: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) ~~(a) through (e)~~.

Claim 3 (Currently Amended): A vector comprising a recombinant expression cassette comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) a polynucleotide comprising at least 200 contiguous bases of the sequence set forth in SEQ ID NO: 35;~~

a) b) a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID No: 35;

b) e) a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID No: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) ~~(a) through (e)~~.

Claim 4 (Currently Amended): A host cell comprising a recombinant expression cassette comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) a polynucleotide comprising at least 200 contiguous bases of the sequence set forth in SEQ ID NO: 35;~~

a) b) a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID No: 35;

b) e) a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID No: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) ~~(a) through (e)~~.

Claim 5 (Previously Presented): The host cell of Claim 4 wherein the cell is a plant cell.

Claim 6 (Original): The host cell of Claim 5 wherein the cell is selected from the group consisting of maize, sorghum, wheat, tomato, soybean, alfalfa, sunflower, canola, cotton, and rice.

Claim 7 (Currently Amended): A transformed plant comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) a polynucleotide comprising at least 200 contiguous bases of the sequence set forth in SEQ ID NO: 35;~~

a) b) a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID No: 35;

b) e) a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID No: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) ~~(a) through (e)~~.

Claim 8 (Currently Amended): A plant seed comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) a polynucleotide comprising at least 200 contiguous bases of the sequence set forth in SEQ ID NO: 35;~~

a) b) a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID No: 35;

b) e) a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID No: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) ~~(a) through (c)~~.

Claim 9 (Withdrawn): A method of reducing pathogenicity of a fungus producing fumonisin or a structurally related mycotoxin, comprising;

a) transforming a plant cell with a vector comprising a polynucleotide selected from the group consisting of:

- i. a polynucleotide comprising at least 20 contiguous bases selected from SEQ ID NOS: 35, 37, 39, 41, 41, and 45;
- ii. a polynucleotide comprising at least 70% sequence identity to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45;
- iii. a polynucleotide comprising at least 80% sequence identity to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45; and
- iv. a polynucleotide complementary to a polynucleotide of i. through iii.
operably linked to a promoter;

b) growing the plant cell under plant growing conditions; and

c) inducing expression of said polynucleotides for a time sufficient for amounts of the fumonisin esterase and APAO enzymes to accumulate to levels that can inhibit the fungus.

Claim 10 (Withdrawn): A method of making an APAO enzyme comprising the steps of:

a) expressing a polynucleotide in a recombinantly engineered cell, wherein the polynucleotide is selected from the group consisting of:

- i. a polynucleotide comprising at least 20 contiguous bases selected from SEQ ID NOS: 35, 37, 39, 41, 41, and 45;
 - ii. a polynucleotide comprising at least 70% sequence identity to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45;
 - iii. a polynucleotide comprising at least 80% sequence identity to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45; and
 - iv. a polynucleotide complementary to a polynucleotide of i. through iii. operably linked to a promoter;
- b) purifying the enzyme.

Claim 11 (Withdrawn): A method of making an APAO enzyme, comprising the steps of:

a) expressing a polynucleotide in a plant, wherein said polynucleotide is selected from the groups consisting of:

- i. a polynucleotide comprising at least 20 contiguous bases selected from SEQ ID NOS: 35, 37, 39, 41, 41, and 45;
- ii. a polynucleotide comprising at least 70% sequence identity to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45;
- iii. a polynucleotide comprising at least 80% sequence identity to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45; and
- iv. a polynucleotide complementary to a polynucleotide of i. through iii. operably linked to a promoter;

and

- b) purifying the enzyme from the plant seed or other plant parts.

Claim 12 (Currently Amended): An isolated polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) a polynucleotide which hybridizes under high stringency conditions to the full length complement of the polynucleotide as set forth in SEQ ID NOS: 35, wherein said high stringency conditions comprise hybridization in 50% formamide, 1 M NaCl, 1% SDS at 37° C and a final wash in 0.1X SSC at 65° C;~~

a) b) a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35;

b) e) a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) ~~(a) through (e)~~.

Claim 13 (Currently Amended): A recombinant expression cassette comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) a polynucleotide which hybridizes under high stringency conditions to the full length complement of the polynucleotide as set forth in SEQ ID NOS: 35, wherein said high stringency conditions comprise hybridization in 50% formamide, 1 M NaCl, 1% SDS at 37° C and a final wash in 0.1X SSC at 65° C;~~

a) b) a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35;

b) e) a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) (a) through (e).

Claim 14 (Currently Amended): A vector comprising a recombinant expression cassette comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) a polynucleotide which hybridizes under high stringency conditions to the full length complement of the polynucleotide as set forth in SEQ ID NOS: 35, wherein said high stringency conditions comprise hybridization in 50% formamide, 1 M NaCl, 1% SDS at 37° C and a final wash in 0.1X SSC at 65° C;~~

a) b) a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35;

b) e) a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) (a) through (e).

Claim 15 (Currently Amended): A host cell comprising a recombinant expression cassette comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) a polynucleotide which hybridizes under high stringency conditions to the full length complement of the polynucleotide as set forth in SEQ ID NOS: 35, wherein said high stringency conditions comprise hybridization in 50% formamide, 1 M NaCl, 1% SDS at 37° C and a final wash in 0.1X SSC at 65° C;~~

a) ~~b)~~ a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35;

b) ~~e)~~ a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35; and

c) ~~d)~~ a polynucleotide complementary to a polynucleotide of a) or b) ~~(a) through (e)~~.

Claim 16 (Previously Presented): The host cell of Claim 15 wherein the cell is a plant cell.

Claim 17 (Original): The host cell of Claim 16 wherein the cell is selected from the group consisting of maize, sorghum, wheat, tomato, soybean, alfalfa, sunflower, canola, cotton, and rice.

Claim 18 (Currently Amended): A transformed plant comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) — a polynucleotide which hybridizes under high stringency conditions to the full length complement of the polynucleotide as set forth in SEQ ID NOS: 35, wherein said high stringency conditions comprise hybridization in 50% formamide, 1 M NaCl, 1% SDS at 37° C and a final wash in 0.1X SSC at 65° C;~~

a) ~~b)~~ a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35;

b) ~~e)~~ a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) ~~(a) through (e).~~

Claim 19 (Currently Amended): A plant seed comprising a polynucleotide encoding a protein having fumonisin degrading activity, said polynucleotide selected from the group consisting of:

~~a) — a polynucleotide which hybridizes under high stringency conditions to the full length complement of the polynucleotide as set forth in SEQ ID NOS: 35, wherein said high stringency conditions comprise hybridization in 50% formamide, 1 M NaCl, 1% SDS at 37° C and a final wash in 0.1X SSC at 65° C;~~

a) b) a polynucleotide comprising at least 90% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35;

b) e) a polynucleotide comprising at least 95% sequence identity to a polynucleotide as set forth in SEQ ID NO: 35; and

c) d) a polynucleotide complementary to a polynucleotide of a) or b) ~~(a) through (e).~~

Claim 20 (Withdrawn): A method of reducing pathogenicity of a fungus producing fumonisin or a structurally related mycotoxin, comprising:

a) transforming a plant cell with a vector comprising a polynucleotide selected from the group consisting of:

- i. a polynucleotide which hybridizes under high stringency conditions to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45;
- ii. a polynucleotide comprising at least 90% identity to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45; and

- iii. a polynucleotide complementary to a polynucleotide of (a) through (b).
- b) growing the plant cell under plant growing conditions; and
- c) inducing expression of said polynucleotides for a time sufficient for amounts of the fumonisin esterase and APAO enzymes to accumulate to levels that can inhibit the fungus.

Claim 21 (Withdrawn): A method of making an APAO enzyme comprising the steps of:

- a) expressing a polynucleotide in a recombinantly engineered cell, wherein the polynucleotide is selected from the group consisting of:
 - i. a polynucleotide which hybridizes under high stringency conditions to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45;
 - ii. a polynucleotide comprising at least 90% identity to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45; and
 - iii. a polynucleotide complementary to a polynucleotide of (a) through (b).
- and
- b) purifying the enzyme.

Claim 22 (Withdrawn): A method of making an APAO enzyme comprising the steps of:

- a) expressing a polynucleotide in a plant, wherein said polynucleotide is selected from a group consisting of:
 - i. a polynucleotide which hybridizes under high stringency conditions to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45;
 - ii. a polynucleotide comprising at least 90% identity to a polynucleotide selected from SEQ ID NOS: 35, 37, 39, 41, 43, and 45; and

- iii. a polynucleotide complementary to a polynucleotide of (a) through (b).
- and
- b) purifying the enzyme from the plant seed or other plant part.